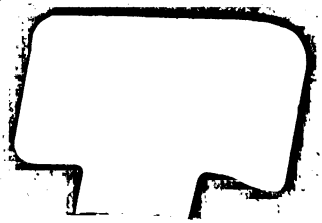

HOW TO MIX PAINTS

A Simple Treatise Prepared for the Wants of the Practical Painter

BY

C. GODFREY

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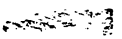

PREFACE.

ALTHOUGH house painting is a distinct and well-defined trade in itself, yet it merges into many other trades. For example, the carpenter, the builder, the carriage builder and many others are called upon from time to time to do more or less painting. The great difficulty with those who have not had the benefit of a long training and experience is in the mixing of colors. They may be able to produce a good paint by taking so much white lead, linseed oil and turpentine; but when it comes to matching a given color they are usually at a loss. This little book is produced for the aid of such men. It does not pretend to be an exhaustive treatise, but as far as it goes it will be found to be accurate.

Some of the principal colors in ordinary use have been selected and instructions are given as to how they may be produced. The reader may ask whether it would not be better to give the exact proportions of the different colors necessary

to produce a given tint or hue. This plan is quite impracticable for the simple reason that the colors on the market vary so greatly in strength. If so many parts of different colors were mentioned, the painter who used first-class materials would get a totally different result from one who was in the habit of using an inferior grade of goods. The author therefore decided that the most useful plan to follow is to give the method of producing a good color, and has taken materials of ordinary quality as a basis.

The writer trusts that this small work will be of considerable use to his readers.

In conclusion I would state that this little book was written in conjunction and by arrangement with Mr. Arthur S. Jennings, of London, author of a larger work entiled "Paint and Color Mixing."

THE AUTHOR.

New York, August 31st, 1904.

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HOW TO MIX PAINTS.

CHAPTER I.

Mixing Paints.

BEFORE proceeding to describe the method of mixing various colors of paint it would be well to explain briefly what paint is and of what it is composed. The most familiar example of paint is the well-known white lead which, when applied to any material, covers and hides it and has the effect of preserving it from decay. If color be added to the white lead as a base, any tint may be obtained. The white lead is, when made, ready for use in the form of a dry powder; but before it goes into the hands of the painter it is several times ground in linseed oil, and is then supplied to him in a thick, heavy paste, very similar in appearance to putty, excepting that it is whiter.

In order to bring this heavy mass of white lead into a condition suitable for its being applied to

a wall, door or other surface by means of a brush, three materials are added : First, an oil, which is almost always linseed oil; second, turpentine, and third, driers. The object of the oil is to bind the particles of the white lead together. Turpentine is added to thin down the mass so that it may be sufficiently liquid to apply easily. Driers are employed to assist the paint to dry. Some paints need more driers than others, therefore the reader must be warned here against the danger of using driers too freely. An excess of driers will actually retard the drying instead of assisting it.

Zinc white is an excellent pigment which exceeds white lead in value, according to the opinion of many, it being much whiter and finer.

We may assume, then, that white lead or some other suitable pigment is the base of paint or color, and the object of this little book is to instruct the reader how to obtain any one of the ordinary colors.

In some cases lead may be absent. For instance, ochre can be used by itself, as can also metallic oxides.

In most cases it is advisable when mixing a

batch of paint to first mix the white lead and to add the color afterward. We will suppose that an ordinary batch of paint is to be mixed for use on the outside of a frame house. We should take a painter's can or pot and pour a little oil into it, taking care to "swill" it around, so that it touches every part of the inside of the can. The object of doing this is to prevent the lead sticking to the can, which it otherwise would do. We then take a knife or "paddle" (which is easily formed out of a piece of wood in the shape of Fig. 1) and remove a lump of lead from the

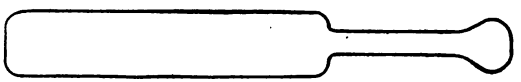


Fig. 1.

keg and place it in the can and add a little oil. We then stir the paddle around in order to break up the lumps, adding oil and turpentine until the mixture is almost like cream. We have now, of course, a white paint ready for use, excepting straining, but we wish to make it of some particular color, which we mix separately and add to the white in small quantities.

The simplest way of mixing colors is to use a slab of glass or marble and to employ a spatula or a flexible knife. Place the color or colors on the slab, add a little oil and thoroughly mix them by means of the knife, adding more of any particular color until the required shade is obtained. Add more oil and turpentine in order to secure the proper consistency. The color is now ready to be added to the white.

It will clearly be seen that it will require a good deal of judgment to decide how much color to add to the white, so that it is well to experiment on a small scale before mixing a whole pot full, so that one may fairly well know the amount of color required for the pot of paint. It should be remembered that it is very easy to add more color to a pot of paint but impossible to take any from it. Therefore the color is best made by adding very small quantities at a time. Under no circumstances must dry color be added to a can of paint, as the results are quite sure to be unsatisfactory. In fact, it is wholly impossible for even an expert painter to produce a proper paint unless he mixes his colors separately If one is so unfortunate as to add too much color,

the only thing to be done is to add enough of the white paint to produce the desired tint.

It will be seen from the foregoing that mixing paints is a somewhat complicated process, requiring practice and experience; and it is probably for this reason that ready mixed paints are so largely used throughout the United States. In England, Germany and France and many other places this class of paint is almost unknown. The objection to ready mixed paints is that they must be made of materials which will not deteriorate or spoil when kept for some time. Of course ready mixed paint may be on the shelf of the painter's store for a year before it is used, and unless something was put in its composition to "disturb" it, it would become almost useless. To one very well known brand, sold throughout America, water is added in order to keep the paint from going "fatty."

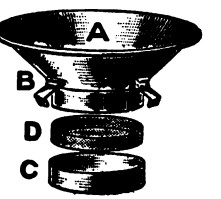
Having mixed first our batch of white paint and then added the color separately, we stir the whole up thoroughly with the paddle, try a little of the paint, and keep trying until at last we have the color required.

But before the paint is ready to be applied,

there is a very important thing to do, viz., to strain the paint.

Straining Paints.

If one compares an ordinary job of painting done by a first-class painter with that executed by an amateur or less experienced hand, he will find in, perhaps, ninety-nine cases out of a hun-



A—Body of Strainer.
B—Clips to hold **C** and **D** in place.
C—Compression Band.
D—Wire Gauze.

Fig. 2.

dred, that the latter shows on its surface a number of specks or little bits, while the former is beautifully smooth. The reason for this is that the painter knows enough to thoroughly strain every ounce of paint before he uses it. However fresh the materials may be that are employed there will still remain particles that have not

been reduced to the same consistency as the rest, and no job of painting can be successfully carried out unless all these little particles are removed.

Paint strainers can be obtained cheaply enough. Those are best which have adjustable bottoms which can be removed. Some with wire gauze are good (see Fig. 2), but unless care is taken

Fig. 3.

this gauze gets filled in with the paint and choked up in time. The kind which the writer likes best is intended to be used with a bit of muslin or coarse cloth. The usual form is shown in Fig. 3, excepting that it has a bottom having large holes in it. This is hinged on and the piece of muslin placed inside. The rim at the bottom holds the muslin in place, while the bottom supports it,

and the holes let the paint drop through after it has found its way through the muslin. When this is used it is easy to work the paint around in the strainer with a brush or piece of stick so as to "persuade" as much of it as possible to pass through. Many painters strain all their paint at least twice, and some go as far as doing so three times. Personally, the writer believes that paint should be strained twice for good inside work; but a coarse piece of muslin may be used the first time so that the actual process of straining be not too long delayed. The paint having been thus strained is quite ready for use. The reader may think, having read the foregoing, that the operation would take too much time, and no doubt for a totally inexperienced hand a considerable amount of time would be expended in obtaining the desired color. On the other hand, it is well worth learning to strain well; and if once a man becomes an expert he can match a batch of color almost in a few minutes; the rest of the operation is quite simple. There is also this advantage, that one knows what he is using. For cheap work cheap materials may be used.

A word may be said here as to the employment of machinery for mixing paints. No doubt large

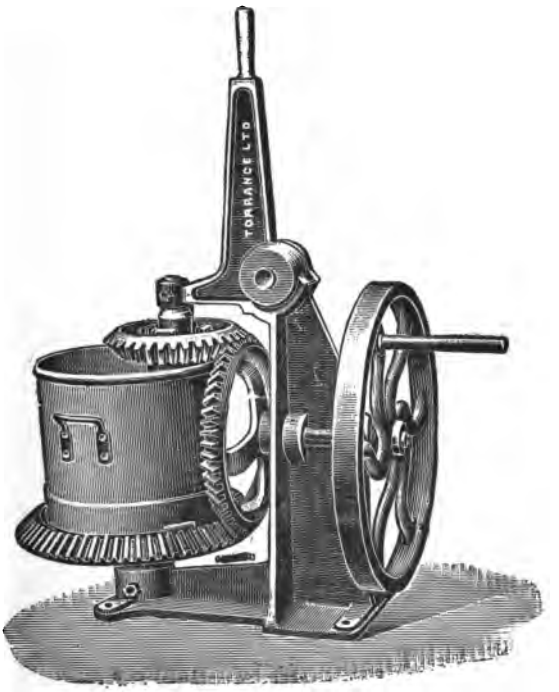


Fig. 4.

manufacturers are able to send out their paints so beautifully fine and cheap because they have

powerful machinery for handling them. Now, painters who do any considerable trade will always find it to their advantage to use a paint mixer. One is shown in Fig. 4, of English make;

Fig. 5.

but there are many others on the market that can be had without difficulty for a few dollars. The one shown in the illustration will hold five gallons, and a study of the cut shows that the

paint holder revolves in one direction, while the stirrers inside revolve in another direction, thus mixing up the materials completely and in a very short time. A useful appliance for every paint shop is a handy paint mill, such as is shown in Fig. 5. It is very useful for grinding up the hard and dry paint which cannot be avoided, even in the best regulated shops, and, if properly used, it saves its cost in a year.

Brushes.

One of the chief difficulties which many young painters have to deal with is in connection with the brushes they use. Frequently they use but common brushes, under the mistaken notion that it is economical to do so, while, in fact, the exact reverse is true. In the first place, it is impossible to do good work with bad tools. Even the most expert workman cannot be expected to "lay off" a coat of paint evenly and quickly if he has a brush which consists of a good deal of horse hair instead of hogs' bristles, because such a brush lacks spring and elasticity. Moreover, cheap brushes last a very little time compared with those of good make. Possibly brushes of

inferior quality are sold so quickly simply because those who purchase and use them do not know how to keep them properly when not in use. A few hints on this important subject will therefore be welcomed by the reader.

Writing Pencils.—Writing pencils should be washed in turpentine until quite clean and until every particle of paint is removed from them. They may then be placed aside and will be ready for use the next day. If they are not to be used again for some time they should be dipped in olive oil and smoothed between the thumb and finger from heel to point.

Stipplers.—These brushes cost a good deal of money, and for that reason should receive great care. The manner of keeping them, however, is simple. They should be washed with pure soap and hot water, well rinsed afterward in cold water and then placed bristles downward to dry. It is advisable not to allow the bristles to support the brush, and a good plan to avoid this is to make a box in which they can slide.

Varnish Brushes.—The general practice is to keep these brushes in turpentine. This is a great mistake. They should be kept in boiled oil or

varnish; and on no account must they rest on their bristles but should be suspended by the the handle. It is advisable that varnish brushes be kept, as far as possible, in exactly the same kind of varnish as that in which they are intended to be used.

Paint Brushes.—These brushes should before using be steeped in water to swell the bristles in the binding, and so prevent them from falling into the paint or on the work. After a thorough soaking the brush should be taken out of the water and well dried. They are then ready for use.

Some authorities do not recommend putting a brush in water to soak, as a quantity of water is likely to be retained in the inside of the bristles (which are hollow), to the detriment of the brush.

After brushes have been used they should be thoroughly cleaned in turpentine or soap and water. If a brush becomes hard it should be soaked in raw linseed oil for twenty-four hours and then washed out in hot turpentine. Varnish brushes should never be used in paint, nor paint brushes in varnish.

By a little care in keeping brushes they will last a considerable time, provided that good ones are bought at the beginning, and that they are really made of pure hogs' bristles.

Tints and Shades.

It will be understood that in mixing a color it may be made either lighter or darker by adding white or black. The result of the addition of white to any color is called a "tint," and the addition of black produces what is termed a "shade." As a rule, it is dangerous to add black to a color because it will not often produce what is wanted. If a color is too bright it can be toned down by adding what is called its "complimentaries."

Without going into the subject of color harmony or theoretical color to any extent, we may take the three primary colors, which are red, blue and yellow. If a red is too bright it can be toned down by the addition of a little blue and yellow; if a blue is too bright, a little red and yellow will take off its keenness; while if yellow is too bright, a little blue and red added will tone it down nicely. This is an important

hint, because painters so frequently, when they are mixing colors, fail to obtain the right shade, and then proceed to add white, which makes the color too weak. Then they add black, which causes the color to be further away than ever from what is wanted.

Sometimes a scheme of decoration is carried out in what is called "self-colors." This means that any color is taken, say sienna, and that the self-same color is employed in varying tints, that is, with more or less white added in various portions of the decoration. For example: We have made a room with pure sienna border, a considerable amount of white added for the main walls and less white on the frieze. Such schemes of decoration have the advantage of being simple in character, easy to produce, and within the scope of those who have not had considerable experience in decorative matter.

CHAPTER II.

Reds.

THE average conception of what a red is would probably come closer to a crimson than a true red. If the reader will take the trouble to buy a cake of water color called "light red" he will find it to be something very similar to burnt sienna. A true red is much nearer crimson; in fact, vermilion, a color which every one knows, is, perhaps, as correct a red as one could have. The very bright reds are mostly made from aniline dyes and are not permanent, although if a coat of varnish be applied over them they will last almost, if not quite, as long as true vermillion.

In the following list the principal reds are mentioned, and it may be stated generally that mixtures are not desirable when a bright red is required. It is much better to buy exactly the shade desired. At the same time one frequently has occasion to brighten a red or to make it less

bright. If it is too bright a little blue and yellow added will lower it nicely; but on no account must black be added or the tone of the color will be spoiled. To brighten red add orange, carmine or madder. Try this with a small quantity of paint as an experiment.

Apricot.—This color might perhaps be more properly included under the heading of yellow, it being a deep, dull orange red. It can obtained by mixing chrome yellow with a little vermilion and adding a very little lake or carmine.

Blood Red.—This can hardly be said to be a well-known color, yet sometimes a color is called for under this name. It may be produced by taking bright red, and adding a little black until the desired tone is obtained.

Brick Red.—Brick color means, of course, the color of red bricks. Add two parts of French ochre to one part of white lead and one part of Venetian red. If this is too bright add more ochre.

Carnation Red.—This beautiful and brilliant color is obtained by mixing three parts of carmine and one part of white lead. The brilliancy is added to if zinc white is used instead of white

lead. This color is somewhat fugitive, hence not suitable for outside use.

Cherry Red.—Mix crimson lake, raw sienna and azure blue, or take two parts of vermilion and one part of chrome.

Claret.—This color may be obtained by mixing carmine with ultramarine blue.

Flesh Color.—There are several ways of obtaining this color. Orange, such as middle chrome yellow, added to white produces a flesh color; but a better mixture is a little yellow ochre and a touch of Venetian red added to a considerable quantity of white as a base. Vermilion is sometimes used, but this is too bright.

Geranium.—This color is best produced by lightening up Indian red and glazing with madder lake, that is, giving a final or covering coat of that lake, which, being transparent, allows the under red to show through.

Old Rose.—Tint white lead with French ochre, Italian red and lamp black.

Peach Bloom.—Indian red, or preferably Venetian red, added to white lead gives this tint.

Purple—Ultramarine and vermilion added to a little white gives a rich purple.

Rose.—If this color is to be used inside, carmine added to white lead will give a beautiful tint. This color will not last out of doors.

Salmon.—Mix together one part of vermilion and six parts of white lead and then add a little lemon chrome yellow.

Scarlet.—This is the name of a well-known bright red which is best purchased ready made. It can, however, be imitated by mixing bright vermilion with orange chrome and white.

Wine Color —A little ivory black added to a mixture of carmine and vermilion will give this color.

CHAPTER III.

Blues.

THE reader is advised to take samples of the following blues to commence with in order to compare them, viz.: Prussian blue, ultramarine, cobalt, indigo and Brunswick blue. Now mix with each a little white and then a larger proportion of white and note the difference in tone. Cobalt is very near ultramarine in shade.

On the whole, Prussian blue is the most useful blue employed by the house painter; in fact, it is doubtful whether there is a more useful color employed in the trade. If it is of good quality it is very strong and a little of it will go a long way. Its strength leads to its adulteration to a considerable degree.

The writer remembers a case which occurred some years ago, of a painter who had used a certain adulterated Prussian blue, and had been in the habit of adding a little to his batches of

white in painting outside work, such as sashes; this blue, of course, being added to remove the yellow cast which white lead invariably possesses. He was persuaded to use a new make which cost a cent or two more a pound, but was very much stronger. He added this to the usual quantity and was astounded to find that instead of white he had a distinct sky blue! Prussian blue is sometimes used for a body color; but, if pure, it is generally necessary, owing to its great strength, to reduce it considerably.

Cobalt.—This is an expensive color, and there are one or two substitutes on the market which are well worth the attention of painters. A warning should here be given concerning ultramarine, which must never be mixed with white lead, or any pigment containing lead, chrome yellow, for instance, as a chemical action will take place, owing to the sulphur contained, which will result in the mixture losing its tone to a great extent, and becoming a dull, muddy color. A painter told the writer once that he had mixed ultramarine with lead for years, and never found it change color in the least; but an investigation showed that the so-called white

lead was not white lead at all, but zinc mixed with a large proportion of barytes.

Azure Blue.—A little ultramarine mixed with zinc produces this useful color.

Blue Grass Tint.—This is as much a green as it is a blue, and is made by mixing three parts of Paris green with seven parts of white lead and one part of Prussian blue. The green being very transparent, although brilliant, and the blue very strong, a peculiar tint is obtained that can hardly be produced in any other way.

Bronze Blue.—This may be made by mixing three parts of black with one part of Prussian blue. This gives what may be looked upon as almost black with a blue cast. Of course, if a bright color is desired, more blue must be added or a greater quantity of white.

Brunswick Blue.—This may be bought ready made. It can be looked upon as simply a Prussian blue lightened with white.

Celestial Blue.—This name is given to a somewhat greenish blue, which may be made by mixing equal parts of chrome green, Prussian blue and white lead, although more white lead may suit the wants of some painters best.

French Blue.—This is the name applied to the best quality of artificial ultramarine. Ordinary ultramarine blue, mixed with one part of chrome green and four parts of white will approximately give the color.

Heliotrope.—Mix together eight parts of zinc white, three parts of scarlet or other bright red and four of ultramarine.

Lavender.—Ultramarine with a little carmine added to zinc will give a very good lavender for inside work. For outside work, use ultramarine and white lead mixed with a little carmine and ivory black.

Marine Blue.—This is a very dark blue which is obtained with one part of ultramarine and six parts of ivory black.

Mauve.—Four parts of oxide of zinc and one part of carmine lake gives an excellent mauve, but blue, red and white mixed in practically any proportions in which the blue predominates will give a tint which might not improperly be thus named.

Nile Blue.—This is a pale greenish blue which may be obtained by mixing Prussian blue and chrome green with white.

Oriental Blue.—Mix twenty parts of white lead and two parts of Prussian blue and one part of lemon chrome yellow.

Peacock Blue.—This is best made by taking cobalt as a base and adding a little white and a little Chinese blue.

Pompeian Blue.—Tint white with ultramarine; add a little vermillion and Italian ochre.

Porcelain Blue.—Mix one part each of zinc white and chrome green with four parts of ultramarine blue and add a touch of black.

Robins' Egg Blue. — Tint white with ultramarine and tinge with a little lemon chrome green.

Royal Blue.—This is a very rich color which may be bought ready made. It may be imitated by adding a little white to Prussian blue with a touch of crimson lake.

Sky Blue.—This is obtained simply by adding a little Prussian blue to white, say one part to one hundred. If a very fine tone is required, cobalt should be used instead of Prussian blue.

Torquoise Blue.—Two parts of cobalt blue, one part of emerald green and twelve parts of white lead.

CHAPTER IV.

Yellows.

AT the present time various yellow tints or hues are very popular in the United States. Indeed, for a good many years past yellow has remained a favorite. It is well, therefore, that the reader should make himself fully acquainted with the different varieties of yellow and how they may be obtained. The painter should take the following yellows and experiment with them.

Take chrome yellows, Nos. 1, 2 and 3, or what are sometimes called "light," "medium," and "orange." Take a little cadmium yellow and some yellow ochre. Put aside, also, a little burnt sienna and Venetian red. Now add a little linseed oil to each of the yellows and spread them out separately with a pallette knife. Compare with the others carefully and note the difference between them. It will be seen that the orange chrome, for example, approaches a red in hue,

while the light yellow or canary chrome has often a distinct greenish cast.

Next add a little of the Venetian red to each and see the difference it makes. When added to the orange chrome the difference can hardly be seen, while its addition to canary chrome gives a distinct richness, although it causes it to lose the particular distinguishing characteristic of that color. The painter may go on almost indefinitely with these different experiments, comparing one with the other and noting carefully the difference which the addition of a little red, black, green or other color makes. It is hardly too much to assert that an hour each day spent in this way for a week will yield information of lasting service and enable the painter to mix with a much greater facility than he could do by merely studying a particular color which it is desired to match. In other words, it is like learning the A B C of the business.

We will now give a few of the chief yellow colors which are in most demand.

Amber. — Orange chrome, burnt sienna and burnt umber should be added together in equal proportions and then a little black added. This

should then be used to tint white lead in sufficient quantities to obtain the amber color required.

Brass Yellow.—This color is, of course, simply bright, strong yellow. It may be made by mixing white lead and canary chrome yellow in proportions of about ten of the former to one of the latter, and then adding a little raw umber or a little burnt umber. Some painters prefer to mix French chrome and medium chrome yellow.

Bronze.—This color perhaps hardly comes under the head of yellows, although it is difficult to find a more appropriate heading. Mix one part of orange chrome with two parts of strong green and add this to about three times the quantity of black.

Bronze Yellow.—This is best obtained by mixing chrome yellow and orange ochre and adding a little burnt umber.

Buff.—Buffs and creams are very difficult to distinguish from one another. That is to say, there is no clear line of demarkation between the one and the other. An ordinary buff is made by tinting white lead with yellow ochre in the proportion of about two of lead to one of ochre.

Sometimes a little black is added, or a little dull red; but as a rule the buffs are obtained simply by mixing white and ochres.

Buttercup.—This bright yellow is easily made by mixing light chrome with white lead.

Canary.—Some color manufacturers have an extra light chrome which they sell under this name. It can, however, be prepared by mixing three parts of yellow chrome and one part of zinc white.

Cream.—A touch of Venetian red added to French ochre and white, and varying in proportions, gives a variety of creams.

Daffodil.—Mix lemon chrome with a little Venetian red.

Ecru.—French chrome and medium chrome yellow mixed with white lead gives a good ecru, but some painters prefer to use black, yellow and Brunswick green with white.

Ivory.—A very little golden ochre added to white lead gives an ivory color. If antique ivory is required it can be obtained by painting the wood work white and then taking a little black japan, thinning it down with turpentine, stirring in a little chrome yellow, which will give it a

slightly greenish cast. "Flow" this over the work, wipe it off, allowing it to give an antique appearance to the corners.

Jonquil Yellow.—Sixteen parts of white lead, two parts of light red, one part of indigo and a considerable amount of chrome yellow gives this color; but many color makers simply add a little vermilion to chrome yellow to get it.

Lemon.—Lemon chrome yellow can be obtained so easily that it is rarely that one desires to mix this color. A variety of tints can, of course, be obtained by adding white lead to chrome yellow until the desired color appears.

Light Deck.—This is obtained by mixing lemon chrome yellow, medium chrome yellow and white in about equal proportions. Sometimes ochre only is used.

Manila.—This color, which is sometimes called "deep deck," is made by tinting lead with yellow chrome.

Marigold.—This is obtained by mixing a little bright red with orange chrome until the desired hue is obtained.

Old Gold.—This may be made by mixing ochre and burnt sienna, or, if a better tint is wanted,

use medium chrome with a little vermilion and burnt sienna and add a very little black.

Olive Yellow.—Take three parts of burnt umber and one part of lemon chrome yellow and olive yellow will be obtained, which may be varied in tint according to the quantity of yellow added.

Orange.—This is simply orange chrome yellow, which is one of the commonest colors on the market.

Primrose Yellow. — Lemon or light chrome should be used by itself.

Stone Color.—White mixed with French yellow ochre and a touch of burnt umber gives this, or a little raw umber may also be added.

Straw.—This is obtained by tinting white lead with chrome yellow; if too vivid, add a little French ochre.

Zinc Yellow.—This is a made color which has the advantage that it may be mixed with any other pigment without being influenced.

CHAPTER V.

Browns.

BROWNS may be said to vary from colors which are nearly yellow down to those which are of a distinct reddish hue. Ordinary browns may be said to range from such colors as umber, which is a deep, rich brown, to sienna. An ordinary sienna is a typical brown. When these colors are used for painting the outside of frame houses, in combination with yellows and various shades of olive green, it is usually best to keep them somewhat dull in tone. There are many ordinary browns which might be termed deep yellows; and there is a wide range of deep, dull reds which might be called the principal browns in common use.

Auburn.—Mix three parts of golden ochre with one part of burnt umber, and add to this, say, twenty parts of white lead.

Brunswick Brown.—This color is sold under this name, but an imitation can readily be ob-

tained by mixing one part of orange chrome yellow and one part of yellow ochre, adding black until the desired shade is obtained.

Bronze Brown.—This is a very dark color of a greenish cast. Black, colored with orange chrome and some bright green, may be used. An excellent bronze brown, which is somewhat transparent, is made by adding chrome green and orange to black japan.

Chestnut Brown.—Two parts of Venetian red and four parts of medium chrome, with a little ochre, will produce a good chestnut.

Chocolate.—Five parts of burnt sienna and one of carmine give a very rich chocolate. A less expensive color is obtained by mixing Indian red and lamp black with a little yellow ochre.

Coffee Color.—To produce this color mix together one part of burnt sienna, two parts of yellow ochre and five parts of burnt umber.

Copper.—Two parts of medium chrome yellow, one part of Venetian red and one of black gives a good copper color. Zinc white, tinted with French ochre, Italian sienna and lamp black is preferable.

Doe Color.—This is readily obtained by adding

to raw sienna a little burnt umber and white lead.

Drab.—There is a very wide range of drabs made by tinting white lead with burnt umber and Venetian red. Raw umber may also be used.

Fawn.—This is a deep drab, and is made by mixing eight parts of white lead, one part of chrome yellow, one of Indian red and one of burnt umber; or white lead may be tinted with a mixture of French ochre, Indian red and lamp black.

Leather Brown.—One part of blue black, two parts of white lead, three parts of Venetian red and four parts of yellow ochre give this color. Less black may be used if desired.

Olive Brown.—This is easily obtained by mixing three parts of burnt umber with one of orange chrome yellow, or lemon chrome yellow may be used to tint raw umber.

Orange Brown.—Two parts of orange chrome yellow mixed with three parts of raw sienna give this color.

Sienna Brown.—Italian burnt sienna and raw ochre mixed with pure zinc white or white lead if desired.

Wall-flower Brown.—This is made by a mixture of medium chrome yellow and lake. Another way of producing it is to mix together crimson lake and burnt sienna, and adding medium chrome until the desired color is obtained.

CHAPTER VI.

Greens.

THERE is perhaps no more useful series of colors than the greens which are now used so extensively in painting frame houses. There is no limit to the number of shades and tints which may be produced; and all that one has to do is to vary their yellows or blues in order to obtain a green bright, strong or dull, as may be desired. The painter who wants to master the subject of greens should proceed upon the lines previously recommended, namely, those of experimenting, and take Prussian blue and mix this with orange chrome yellow, and then take the same quantity of blue and mix it with other shades of chrome. Note the difference in shade, and then, still using Prussian blue, next proceed to add yellow ochre, then burnt sienna, in fact, all sorts of yellows, but the same quantity of blue in each case. Next add a little black.

Having procceded thus far, the young painter will have attained knowledge of most of the important greens. Next, he should start again with medium chrome yellow and mix it with various blues, such as ultramarine, indigo, etc. Here, again, a little black may be added, also a little white. Some of the better greens are obtained by adding black to yellow, which gives a greenish cast. It should be noted here again that ultramarine blue must never to be added to white lead, as the sulphur contained in the latter will cause the mixture to turn black. It must not be forgotten that Prussian blue is a very strong color, and that a little of it goes a long way. It is best, therefore, to mix first in very small quantities so as to prevent waste. The following is a list of the principal greens in ordinary use.

Blue Green.—Medium chrome green, lightened up with considerable white gives a perfect blue green.

Bottle Green.—Five parts of medium chrome green, with one of blue black, gives this color.

Bronze Green.—This very useful green is obtained by mixing either black or indigo with

orange chrome yellow. A lighter bronze may be obtained by using lemon chrome.

Chrome Green.—This color may be bought ready-made, but it may be imitated by adding Prussian blue to lemon chrome yellow in the proportion of about one part of blue to sixteen parts of yellow.

Emerald Green.—This is a well-known color, usually called in the United States "Paris green," and is largely used as an insecticide. It cannot be imitated successfully, but medium chrome green lightened up gives a bright color which may be substituted if nothing better can be found.

Grass Green.—Medium chrome green lightened up with a little chrome yellow gives this color.

Ivy Green.—This is produced by a mixture of French ochre, lamp black and Prussian blue.

Moss Green.—Take medium chrome green and lighten it up with white lead, adding a little French ochre and a very little lamp black.

Olive Green.—There is a wide range of olive greens varying in depth. Ten parts of chrome yellow, one part of Prussian blue and one part of light Indian red give an olive; but some painters

prefer to add Prussian blue and black to chrome yellow, while others prefer, instead, to add a little yellow ochre.

Pea Green.—Chrome green lightened up with about thirty or forty parts of white lead gives a pale bright green usually recognized by this name.

Sage Green.—This is best produced by mixing French ochre, lamp black and Prussian blue with white or raw umber; chrome green added to white lead may also be used.

Seered Green.—Tint white lead with French ochre, medium yellow chrome and a little bright green.

Venetian Green.—Add to dark chrome green sufficient white lead to produce desired tint.

Willow Green.—Tint white lead with medium chrome green, and add a little burnt umber or ivory black.

CHAPTER VII.

Greys.

"GREY" is a mixture of black and white, and may vary from the smallest quantity of black added to white to the other extreme, where a small quantity of white is added to black. Various colors are added to the mixture of black and white, producing a number of greys.

Dark Grey.—This is usually obtained by mixing black and white with a little orange chrome or red.

French Grey.—A little ivory or drop black used to tint white, with a very little carmine or crimson lake and ultramarine, gives a very pretty French grey. The particular cast should be, in the words of a writer, just published, "French grey is often described as a tint which is neither blue nor red, but suggests both."

Granite.—Add French ochre and lamp black to white lead.

Grey Drab.—This may be produced by mixing five parts of black with four parts of white and adding a little orange chrome yellow.

Lead.—This is a dark grey which may be made by adding a little black to white, with sufficient Prussian blue to give the desired tint. Blue black or indigo may be used if desired.

Light Grey.—One part of Prussian blue, one part of lamp black and from ten to twenty parts of white lead give varying shades of light greys.

Mouse Color.—A little blue and yellow added to black will produce this color; but burnt umber and a little Prussian blue added to from twenty to thirty times the bulk of white lead answers well.

Opal Grey.—Add burnt sienna to cobalt blue and white.

Pearl.—This color is produced in the same way as French grey, but is much lighter.

Silver Grey—This is a delicate tint of a distinctly bluish cast. Ivory and black may be employed to produce it by tinting white; but a little Venetian red is sometimes used.

Slate.—A mixture of about one part of Prus-

sian blue to about twelve parts of black added to a little white will give this color.

Steel Grey—This is made from white lead and lamp black to which has been added a little light chrome and orange chrome.

Warm Grey. — Tint white lead with French ochre and lamp black.

CHAPTER VIII.

Colors Made from Black Japan.

MANY painters of great experience are not aware that a number of excellent colors can be obtained by the use of black japan or asphaltum varnish; but a few experiments will quickly show that many such colors, most useful in actual work, can be produced by means of this material.

It is well to observe that, strictly speaking, asphaltum is not permanent, and that in time it fades; but if a good, round coat of varnish is applied over it, it will last for a very considerable length of time.

A bright red, such as vermilion, etc., gives, when mixed with japan black, a rich red which is very useful at times. Yellow added to it gives a neutral green; in fact, any bright color may be added to produce a variety of different colors.

When the painter is called upon to decorate relief material, such as Anaglypta, etc., he will

find that a color produced by mixing japan is very useful; but he must bear in mind the necessity of adding plenty of turpentine, which will cause the color to possess a transparency depending for its depth upon the quantity of turpentine added.

On the other hand, if body is required it may be obtained by adding sufficient drop black.

Every painter should experiment with the above because he will find some surprising effects obtainable.

CHAPTER IX.

Displaying Colors.

THE ready-mixed paint manufacturers of the United States have for a good many years past vied with each other in producing aids for the painter in using their goods; and many of them send out "color combinations," consisting of pieces of painted paper stuck down upon cards, and giving out color schemes for use in frame buildings.

These are somewhat expensive to produce, but the painter who reads this should get all he can, for reference as well as for experiment. As a rule, they are too small to prove of much actual service, excepting to those who are well acquainted with colors and paints.

Now, the painter who is called upon to paint the outside of a house will find that he will get the order much more readily if he can give his customer some idea of how the house will look when it is completed. The customer is usually

shown some small samples of paint, and is expected to make his selection from them. It can hardly be wondered at that disappointment often results. What the practical, ingenious and clever reader ought to do is to prepare such samples that will convince a probable customer that he is well posted on color schemes.

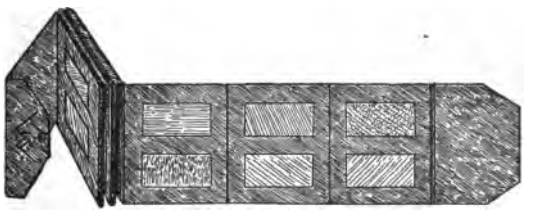


Fig. 6.

In Fig. 6 is shown a device invented by Mr. F. Scott-Mitchell, an eminent English authority, which is intended to be used to show the colors of dado, frieze and wall space, different colors being used on the panels, as may be desired. It will be observed that this device folds up so as to be easily carried. Something of the same kind might readily be prepared by the practical man, showing colors suitable for outside work.

CHAPTER X.

Color Harmony.

IN this little book it is impossible to deal with the subject of color harmony in anything like a complete manner, but a few hints on the subject may prove useful.

If it is desired to color the woodwork of a room in a hue which will go well with the wall-paper, the usual plan is to take the prevailing tint or color on the wall-paper, and to use this on the doors and other woodwork. As a rule, the stiles and rails may be darker than the panels, and if it is thought advisable, a third color may be introduced on the moulding. For example: If the paper be of a light green ground, with a floral pattern printed in darker green, and perhaps with a small pink flower, the following scheme would answer well. The stiles and rails could be green lighter than the ground, but, as a rule, not so dark as the floral pattern. The panels might be quite light, but not lighter than the

ground, unless the ground be particularly light, then pink might be used on the mouldings.

If it be a delicate pink the whole of the mouldings may be colored; but if of a strong color then it would be better to color with pink only a small section of the moulding, following round a few combinations, which will prove effective, both for inside and outside work.

With yellow, plum color, slate or brown may be used.

Orange goes well with a purple tone of red, and a canary colored surface will contrast nicely with a vermilion color or deep ivory.

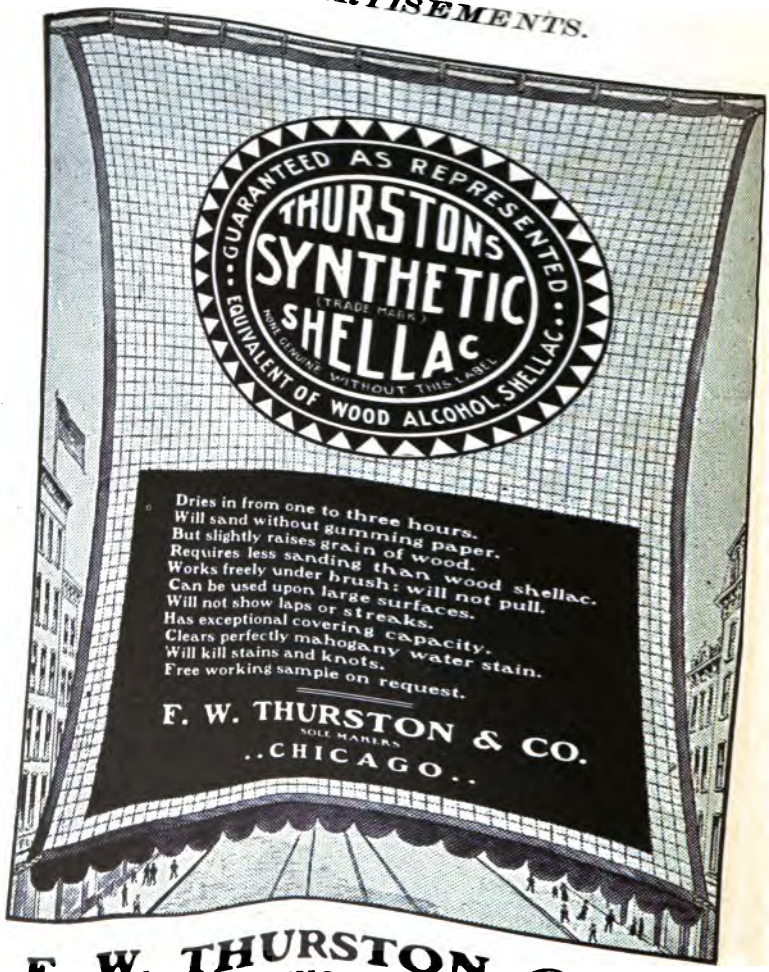
Terra cotta goes well with buff, sage green and Indian red or vermilion; while a deep purple contrasts well with shades of olive green, Venetian red and lilac.

A grey green ground is brightened up with a primrose color; a scarlet tone being introduced into the mouldings and trimmings.

A pea green is toned down nicely by contrast with a chocolate and a lavender, while a grey agrees with a salmon color as well as with a deep blue.

INDEX.

The names of the colors printed in *italics* are those which may be obtained in dry powder form from the majority of paint dealers. These colors are mentioned in the text of the book, hence a list of them will be found useful for reference. These colors are given in their alphabetical order as well as under the group, such as reds, blues, etc., to which they belong.



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